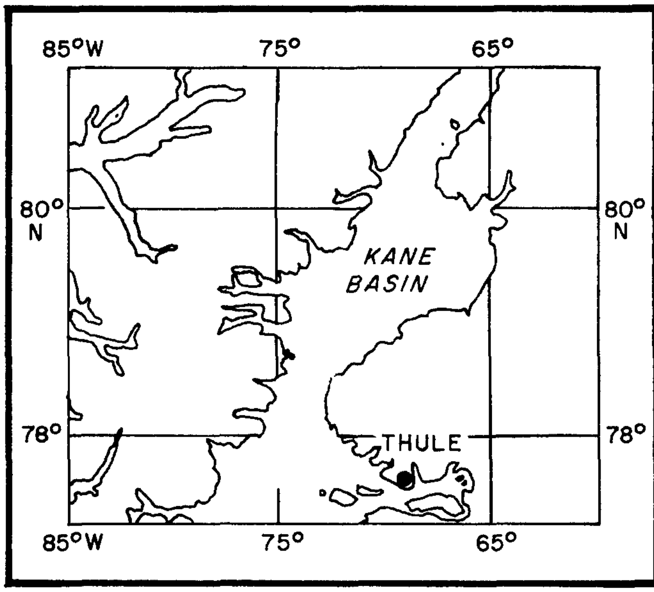
IR No. 70-29

INFORMAL REPORT

OCEANOGRAPHIC CRUISE SUMMARY
KANE BASIN
SEPTEMBER 1969



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NAVAL OCEANOGRAPHIC OFFICE
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INFORMAL REPORT

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ABSTRACT

The Naval Oceanographic Office (NAVOCEANO) conducted a bottom survey of the Kane Basin during September 1969 aboard USCGC SOUTHWIND (WAGB 280). The primary purpose of the survey was to obtain data on the composition and configuration of the Basin floor.

NAVOCEANO operations included core and grab sampling at 47 stations, 9 camera lowerings, and over 1,000 miles of bathymetric soundings. A Coast Guard Oceanographic Unit made temperature, salinity, and oxygen measurements at 19 Nansen cast stations.

The floor of Kane Basin is extremely hard. Corer penetration averaged 121cm and ranged from 0 to 350cm. Based on a cursory examination of less than one-fourth of all samples taken, the following rock types have been identified: garnetiferous and granitic gneiss, quartzite, limestone, granite, slate, sandstone, and coal. The primary agent of transport and deposition affecting the most recent sediments appears to be ice rafting, with stream runoff and current activity playing lesser roles.

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I. INTRODUCTION

The Naval Oceanographic Office (NAVOCEANO) conducted a bottom survey of the Kane Basin from 5 to 14 September 1969 (Operation Number 920006) aboard USCGC SOUTHWIND (WAGB 280). The primary purpose of the survey was to obtain data on the composition and configuration of the basin floor which would add to the understanding of present and past sedimentary processes in arctic regions. This study extends the work done previously by NAVOCEANO and Rensselaer Polytechnic Institute in Baffin Bay during 1967 (Blee, et al., 1968; Codispoti and Kravitz, 1968).

II. PREVIOUS KNOWLEDGE OF THE REGION

A. Physical Setting.

Kane Basin is part of an elongate body of water known as Nares Strait. The area is bordered by northwestern Greenland on the east, by Ellesmere Island on the west, and by Kennedy Channel and Smith Sound on the north and south, respectively.

The basin has an area of approximately 27,000 square kilometers and is about 170 kilometers long and, at its broadest point, 124 kilometers wide. The part of Greenland that borders Kane Basin is generally flat with a comparatively regular coastline. The Humboldt Glacier, a feature 100 meters high and 100 kilometers long, extends from Cape Agassiz in the south to Cape Forbes in the north and divides the ice-free Greenland coastal strip in two. This glacier is presumed to be responsible for much of the sediment and glacial ice found in Kane Basin.

The western shore of Kane Basin extends from the northwestern entrance point of Rice Strait to Cape Collinson, about 140 kilometers northeastward. The shoreline is characterized by many deep indentations; seven narrow fjords trend generally in an east-west direction and penetrate inland for nearly 100 kilometers. The coast rises abruptly from sea level, forming irregular mountains with talus-covered bases and peaks marked by ice caps. The valleys contain many glaciers which discharge glacial ice into the various bays and fjords.

Approximately nine-tenths of the Ellesmere Island coastal area bordering Kane Basin is permanently ice covered. The reason is attributed to the cold, northerly current which causes a continuous stream of ice to build up against the island's eastern shore. The current flowing along Kane Basin's Greenland coast, however, is comparatively ice free (except in the Humboldt Glacier area), and the open water raises the general temperature. The prevailing easterly winds carry more moisture to the western side of the basin, which is often blanketed with fog while at the same time sun is shining on the Greenland coast (Hydrographic Department (Admiralty), 1959).

B. Bathymetry.

The Bathymetry of Kane Basin has been described previously by Pelletier (1964) and Uchupi (1964). The submarine topography of the basin is characterized by two large troughs. The troughs are divided by a broad ridge which shoals from Smith Sound northeastward towards Washington Land, Greenland. The eastern trough begins at the northern end of Humboldt Glacier and extends to the southwest where it gradually deepens from approximately 200 meters to over 500 meters in the direction of Smith Sound. The western trough is shoaler than its eastern counterpart and runs parallel to Ellesmere Island. The bottom of this trough is convex, being more shoal in the center (200 to 300 meters) and becoming deeper at either end (300 meters). A small, narrow, fairly deep trough (400 to 500 meters) is located along the southside of Bache Peninsula; it joins the other troughs at the northern end of Smith Sound.

III. NARRATIVE OF THE SURVEY

NAVOCEANO operations consisted of bottom sediment coring and grab sampling, bathymetry, and underwater photography. Bottom sampling was done at 47 stations, and 39 cores and 45 grabs were obtained. Nine successful camera lowerings resulted in several hundred photographs of the basin floor. Over 1,000 miles of bathymetric soundings were recorded.

U.S. Coast Guard oceanographic personnel made temperature, salinity, and oxygen measurements at 19 Nansen cast stations. The stations were to be taken on a grid to provide sampling control; however, ice conditions precluded strict adherence to the grid and sometimes necessitated taking samples considerable distances from the planned locations. Four stations near Ellesmere Island and two stations in the vicinity of Humboldt Glacier were deleted because of heavy ice. Six stations were added farther south in the area of Smith Sound.

Figure 1 shows the locations of the oceanographic operations. Table I presents a station data summary.

IV. METHODS OF COLLECTION AND ANALYSIS

A. Bottom Sediments.

Grab samples were obtained with "orange peel" type bottom samplers and put in mason jars. The jars then were sealed and placed in wooden cases.

Core samples were collected using "modified Ewing" open barrel gravity corers with 11-foot barrels that contained 6.35-centimeter ID polycarbonate liners. After coring, the liners filled with sediment were removed from the core barrels, capped, covered with saran wrap, and stored vertically in boxes until analyzed at NAVOCEANO. Several layers of cushioning material were placed between the cores and the bottom of the boxes in an attempt to reduce the effects of ship vibration on the sediment.

At NAVOCEANO, the velocity of sound through the sediment cores was measured using an Underwater Systems Sediment Sound Velocimeter. The cores then were split longitudinally, and one half was analyzed for mass physical properties, texture, carbonate content, and organic carbon content. A preliminary examination of material coarser than 62 microns was made using a binocular microscope. The shear strength of the sediment was determined by the fall cone method (Hansbo, 1957). The other half of the core was x-rayed, photographed, covered with saran wrap, sealed in lay-flat plastic tubing, and put in the core repository at NAVOCEANO.

Microfossils are being analyzed by D. Shumard in the Geology Department of Baylor University, Waco, Texas. Clay mineral identification is being carried out in cooperation with Dr. D.D. Carstea of the U.S. Geological Survey, Washington, D.C.

B. Photography.

Photographs of the sea floor were taken with a single plane underwater camera (Model 200A) and light source (Model 210K) manufactured by EG&G International. The camera and light source were attached to a metal frame that housed a sonic pinger. The pinger emits signals which are picked up by the ship's AN-UQN receiver and passed into an oscilloscope. By monitoring the signals on the oscilloscope, the distance of the camera off the bottom can be determined and controlled.

The camera system was equipped with a delay unit which triggered it at a pre-set time. The bottom was then photographed every 12 seconds until either all the film was expended or the lowering was terminated. After each lowering, several strips of film were developed to ascertain the quality of the photography and to determine whether the system was functioning properly.

C. Bathymetry.

The AN-UQN sonic depth recorder was used to take 1,112 nautical miles of continuous sonic profiles. The AN-UQN operates at a frequency of 12kHz and has a sound beam width of approximately 60°. Soundings were recorded continuously between stations as well as on station, except during camera lowerings. The 0-600 foot (0-183 meter) scale was used in waters less than 100 fathoms (183 meters). The 0-600 fathom (0-1097 meter) scale was used in all other areas. This procedure provided the best bottom topographic resolution that could be obtained from the AN-UQN.

D. Navigation.

Navigation was performed with the aid of Loran A and radar. Precise fixes were difficult to obtain because of the problems encountered in polar navigation and the datum differences between Greenland and Canada. Even when taking into consideration frequent land sightings, it is estimated that the ship maintained an average "on station" accuracy of no better than 3 miles.

V. DISPOSITION OF DATA

All original sediment data records and bathymetric sounding data are on file in NAVOCEANO. Sediment analysis summary sheets are filed under Laboratory Item No. 387. Oceanographic station data are held by the Coast Guard Oceanographic Unit, Washington, D.C.

VI. PRELIMINARY ANALYSIS

The floor of Kane Basin is extremely hard. Corer penetration for the 47 stations averaged 121cm and ranged from 0 to 350cm. At eight (17 percent) of the locations, the corer did not penetrate at all. Figure 2 illustrates the frequency distribution of corer penetration experienced during the survey. The 100cm class intervals were selected arbitrarily. Table II presents the field description of the bottom samples.

When no cores were recovered (zero penetration), the composition of the bottom was determined from grab samples alone. These particular samples invariably consisted of cobbles, pebbles, and coarse sand, which accounted for the lack of corer penetration.

When cores were recovered, they all contained some coarse material. The radiograph in Figure 3 is typical of the upper few centimeters of the majority of the cores. Many of the cores had coarse constituents scattered throughout their entire length; however, the quantity and concentration of this material varied greatly. Only a few of the cores displayed marked stratification.

Most of the underwater photographs showed some form of marine life, and certain parts of the Basin contained abundant benthic fauna. Many of the rocks brought to the surface were encrusted with sessile organisms, both living and dead, such as Bryozoa.

Figure 4 is a photograph of the Basin floor at 79°28.5'N latitude and 72°48'W longitude. At this location, the bottom was strewn with coarse, poorly sorted materials, and crinoids, ophiuroids, and echinoids were present in large numbers. Grab and core samples from the site were composed of grayish-brown sediment made up of cobbles, pebbles, and sand.

Based on a cursory examination of less than one-fourth of all samples taken, the following rock types have been identified: garnetiferous and granitic gneiss, quartzite, limestone, granite, slate, sandstone, and coal. So far, limestone is the most ubiquitous rock type. These results are similar to those reported by Uchupi (1964).

The primary agent of transport and deposition affecting the most recent sediments appears to be ice rafting, with stream runoff and current activity playing lesser roles. At the present time, insufficient evidence has been derived from the materials collected to establish any definite patterns of sediment distribution.

VII. ADDITIONAL WORK NEEDED IN THE REGION

Sedimentological reconnaissance surveys have been completed for Baffin Bay, Smith Sound, and Kane Basin. Similar surveys should be undertaken in Kennedy Channel, Hall Basin, and Robinson Channel, thereby extending coverage over the entire length of Nares Strait.

In addition, sub-bottom profiling should be done in the Baffin Bay-Nares Strait area to compliment and increase knowledge gained from the study of submarine sediments.

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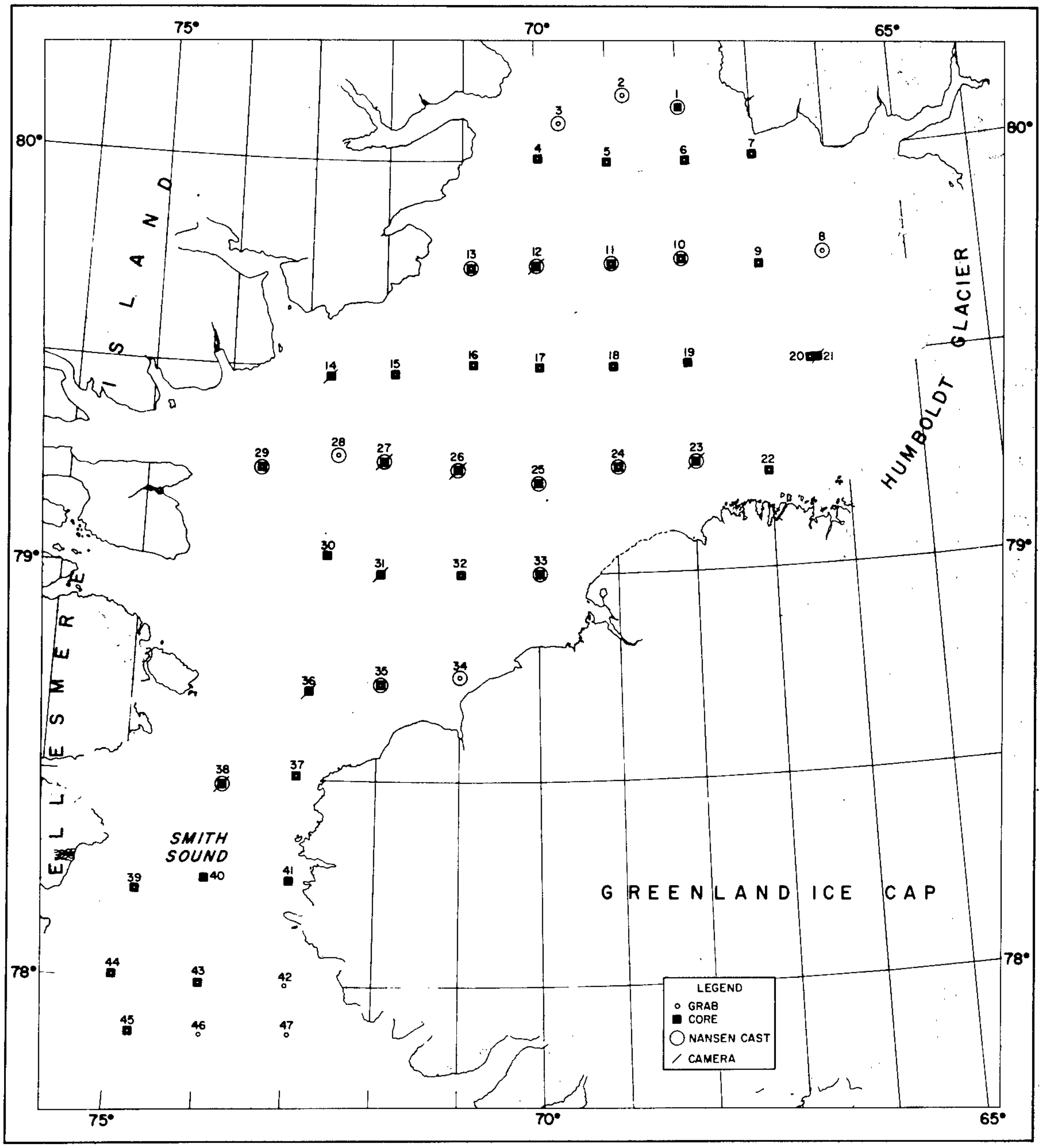

FIGURE 1. Station Locations.

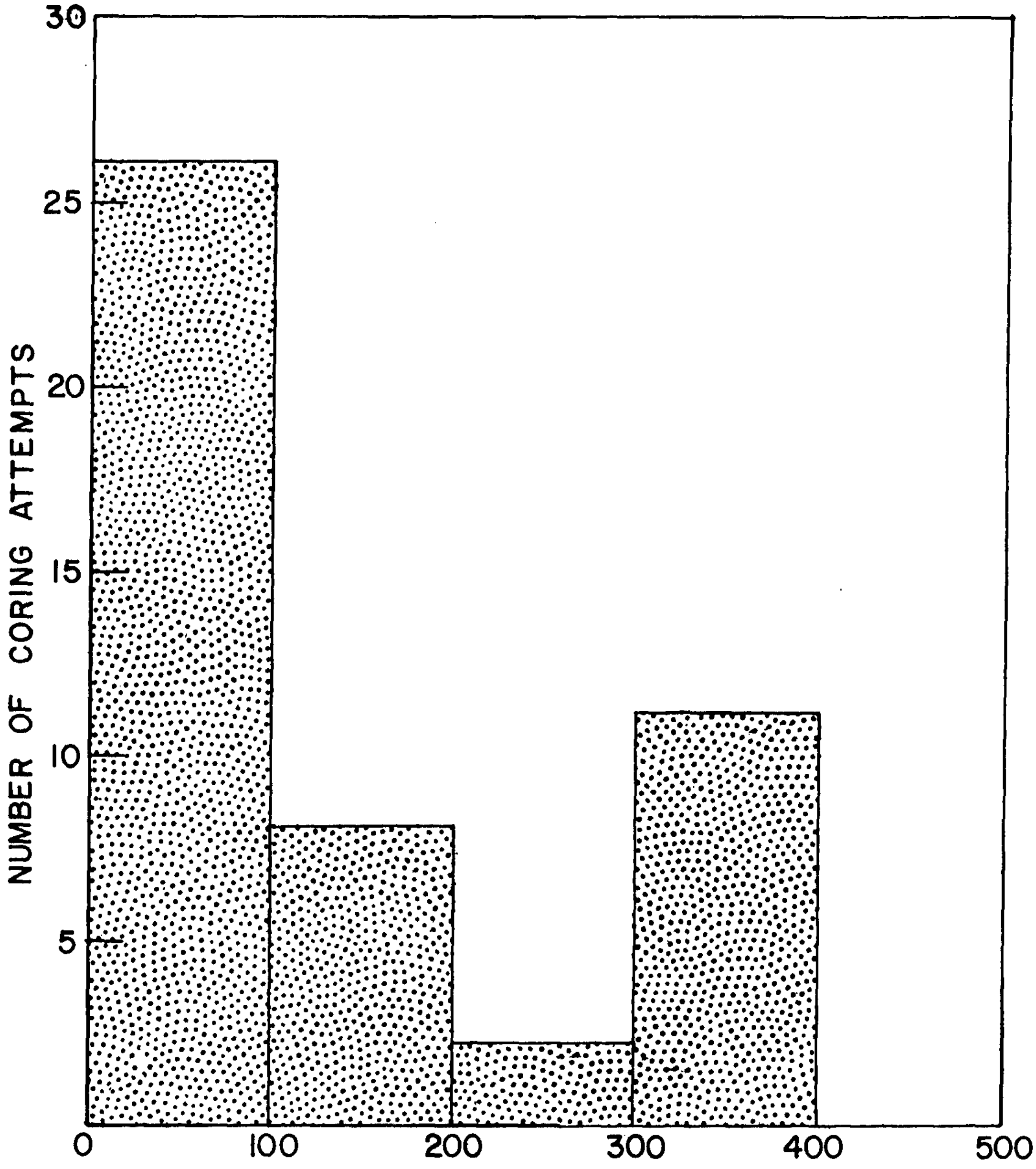

Figure 2. Histogram Depicting Corer Penetration

Figure 3. Radiograph of Core Containing Coarse Ice Rafted Material

Figure 4. Photograph of the Kane Basin Floor at 79°28.5'N, 72°48' W. Water Depth 199 Meters.

TABLE I. Station Data Summary.

Sta. No.	Latitude (°N)	Longitude (°W)	Depth (Meters)	Core	Grab	Camera	Nansen Cast
1	80°15'	68°00'	215	x			x
2	80°18.5'	68°45'	348		x		x
3	80°12.7'	69°40'	372		x		x
4	80°00.5'	69°59'	256	x	x		
5	79°59.8'	69°00.2'	218	x	x		
6	79°59.75'	67°57'	238	x	x		
7	80°00'	67°00'	120	x	x		
8	79°45'	66°08'	158		x		x
9	79°44'	67°00'	101	x	x		
10	79°45.3'	68°02'	96	x	x		x
11	79°45'	69°00'	136	x	x		x
12	79°45'	70°00'	159	x	x	x	x
13	79°44.2'	70°53.0'	265	x	x		x
14	79°28.5'	72°48'	251	x	x	x	
15	79°29.2'	71°58'	245	x	x		
16	79°30.2'	70°56'	190	x	x		
17	79°30'	69°59'	245	x	x		
18	79°30'	69°00'	148	x	x		
19	79°30'	68°01'	227	x			
20	79°30'	66°25'	345	x	x		
21	79°30'	66°20.5'	318	x	x	x	
22	79°14'	67°02'	364	x	x		
23	79°15.6	67°59'	298	x	x	x	x
24	79°15'	68°59'	345	x	x		x
25	79°13'	70°00'	273	x	x		x
26	79°15'	71°03'	199	x	x	x	x
27	79°16.2'	72°00'	183	x	x	x	x
28	79°17'	72°39'	222		x		x
29	79°15'	73°48'	238	x	x		x
30	79°02.5'	72°46'	273	x	x		
31	79°00'	72°00'	218	x	x	x	
32	79°00'	71°00'	373	x	x		
33	79°00'	70°00'	391	x	x		x
34	78°45'	71°00'	150		x		x
35	78°44'	71°59'	382	x	x		x
36	78°42.7'	72°53.5'	445	x	x	x	
37	78°30.5'	72°59'	202	x	x		
38	78°29'	73°52'	538	x	x	x	x
39	78°13'	74°49'	620	x	x		
40	78°15'	74°00'	639	x	x		
41	78°15'	73°00'	123	x	x		
42	78°00'	73°00'	132		x		
43	78°00'	74°00'	519	x	x		
44	78°00.5'	75°00'	648	x	x		
45	77°44.5'	74°44'	570	x	x		
46	77°44.5'	73°58'	311		x		
47	77°45'	72°57.2'	131		x		

TABLE II. Field Description of Bottom Samples.

Vessel: SOUTHWIND				Cruise: KANE BASIN								Checked by	Date checked
Bottom Sediment No. (BS-)	Date 1969	Sample Position Latitude (N)	Sample Position Longitude (W)	Depth Meters	Geomorphology of Immediate Area	Type of Sampler	Weight of Sampler	Approx Pene-tration	Length of Core	Sediment Color Core Top	Sediment Color Core Bottom	Field Description of Core and Remarks	Obs Init
BS-1	9/6	80°15'	68°00'	215		Mod Ewing	350	25	25	Gray	Gray	Coarse sand and pebbles	
BS-1G	9/6	80°18.5'	68°45.0'	348		Orange Peel	2(W)			Brownish	Gray	Coarse sand and Gravel w/some silt and clay	
BS-2G	9/7	80°12.7'	69°40.0'	372		Orange Peel	2(W)			Gray	Gray	Coarse silt, sand, and clay	
BS-2	9/7	80°00.5'	69°59.0'	256		Mod Ewing	350	55	50	Grayish	Brown	Coarse sand, silt, clay and pebbles	
BS-3G	9/7	80°00.5'	69°59.0'	256		Orange Peel	2(W)			Grayish	Brown	Coarse sand, silt, clay and pebbles	
BS-3	9/7	79°59.8'	69°00.2'	218		Mod Ewing	350	50	50	Brownish	Gray	Coarse sand, silt, some clay and pebbles	
BS-4G	9/7	79°59.8'	69°00.2'	218		Orange Peel	2(W)			Brownish	Gray	Coarse sand, silt, some shells, pebbles, & Benthic Life	
BS-4	9/7	79°59.75'	67°57'	238		Mod Ewing	350	40	16	Gray	Gray	Clayey gravelly silty sand (very tough)	
BS-5G	9/7	79°59.75'	67°57'	227		Orange Peel	2(W)			Gray	Brownish Gray	Gravelly sand	
BS-5	9/7	80°00'	67°00'	120		Mod Ewing	350	140	73	Gray	Gray	Silty clay with some sand near bottom	
BS-6G	9/7	79°59'	67°01'	120		Orange Peel	2(W)			Brown Gray	Red	Rocks	
BS-7G	9/8	79°45'	66°08'	158		Orange Peel	2(W)			Brown	Gray	Pebbles, coarse sand, silt, clay	
BS-6	9/8	79°44'	67°00'	101		Mod Ewing	350	20	10	Brown	Gray	Gravelly sand, some shell benthic life	
BS-8G	9/8	79°44'	67°00'	101		Orange Peel	2(W)			Brown	Gray	Gravelly sand, some shell benthic life	
BS-96	9/8	79°45.30'	68°02'	96		Orange Peel	2(W)			Brown	Gray	Gravelly sand - silt, clay, pebbles	
BS-7	9/8	79°44.30'	68°02'	96		Mod Ewing	350	10	10	Brown	Gray	Benthic life, Gray-coarse sand, pebbles, silt, clay	
BS-8	9/18	79°45'	69°00'	136		Mod Ewing	350	20	20	Brown	Gray	Coarse sand, silt, clay, pebbles	
BS-10G	9/8	79°45'	69°00'	136		Orange Peel	2(W)			Brown	Gray	Coarse sand, silt, clay, pebbles	
BS-9	9/8	79°45'	70°00'	159		Mod Ewing	350	240	45	Brown	Gray	Clayey, gravelly, silty sand	
BS-11G	9/8	79°45'	70°00'	159		Orange Peel	2(W)			Brown	Gray	Clayey, gravelly, silty sand	
BS-10	9/8	79°44.2'	70°53.0'	265		Mod Ewing	350	60	35	Gray	Gray	Clayey, silty sand	
BS-12G	9/8	79°44.2'	70°53.0'	265		Orange Peel	2(W)			Gray	Gray	Coarse sand with many shells	
BS-11	9/8	79°28.5'	72°48'	251		Mod Ewing	350	190		Gray and	Brown	Coarse sand	
BS-13G	9/8	79°28.5'	72°48'	251		Orange Peel	2(W)			Grayish	Brown	Coarse sand and rocks	
BS-14G	9/9	79°29.2'	71°58'	245		Orange Peel	2(W)			Grayish	Grayish	Coarse sand, silt & clay	

TABLE II. Cont'd)

VESSEL: SOUTHWIND | CRUISE: KANE BASIN | CHECKED BY: | DATE CHECKED:

BOTTOM SEDIMENT NO. (BS-)	DATE 1969	SAMPLE POSITION LATITUDE (N)	LONGITUDE (W)	DEPTH METERS	GEOMORPHOLOGY OF IMMEDIATE AREA	TYPE OF SAMPLER	WEIGHT OF SAMPLER	APPROX PENETRATION	LENGTH OF CORE	Sediment Color CORE TOP	CORE BOTTOM	FIELD DESCRIPTION OF CORE AND REMARKS	OBS INIT
BS-12	9/9	79°29.2'	71°58'	245		Mod Ewing	350	160	79	Brownish Gray	Darker	Sand, silt, clay	
BS-15G	9/9	79°30.2'	70°56'	190		Orange Peel	2W			Gray	Gray	Sand, silt, clay	
BS-13	9/9	79°30.2'	70°56'	190		Mod Ewing	350	160	--	Gray	Gray	Sand, silt, clay	
BS-14	9/9	79°30'	69°59'	245		Mod Ewing	350	304	139	Brown	Gray	Sand, silt, clay	
BS-16G	9/9	79°30'	69°59'	245		Orange Peel	2W			Brownish	Gray	Sand, silt, clay	
BS-17G	9/9	79°30'	69°00'	148		Orange Peel	2W			Brown	Gray	Rock, silt, sand, clay	
BS-15	9/9	79°30'	69°00'	148		Orange Peel	350			Brown	Gray	Rock, silt, sand	
BS-16	9/9	79°30'	68°01'	227		Mod Ewing	350	160	100	Brown	Gray	Brown-Gray silt and clay	
BS-17	9/9	79°30'	66°25'	345		Mod Ewing	350	To Weight	125	Brown	Gray	Silt, clay, rock	
BS-18G	9/9	79°29'	66°25'	392		Orange Peel	2W			Brown	Gray	Silt, clay, and pebbles	
BS-18	9/9	79°29.5	66°22'	318		Mod Ewing	350	340	230	Brown	Gray	Sandy silty clay	
BS-19G	9/9	79°29.5	66°22'	318		Orange Peel	2W			Brown	Gray	Sandy silty clay	
BS-19	9/9	79°14'	67°02'	364		Mod Ewing	350	340	245	Brown	Brown	Cohesive silty clay	
BS-20G	9/9	79°13'	67°00'	364		Orange Peel	2W			Brown		Cohesive silty clay	
BS-21G	9/10	79°15.6'	67°59'	298		Orange Peel	2W			Brown	Gray	Silt, clay, rock	
BS-20	9/10	79°15.6'	67°59'	298		Mod Ewing	350	120	53	Gray	Gray	Silt, clay	
BS-21	9/10	79°15'	68°59'	345		Mod Ewing	350	337	280	Brown	Gray	Silt, clay	
BS-22G	9/10	79°15'	68°59'	345		Orange Peel	2W			Gray	Gray	Silt, Clay	
BS-23G	9/10	79°13'	70°00'	273		Orange Peel	2W			Gray	Gray	Silt, clay and pebbles	
BS-22	9/10	79°13'	70°00'	273		Mod Ewing	350			Brown	Gray	Silt, clay	
BS-23	9/10	79°15'	71°03'	199		Mod Ewing	350	308	80	Brown	Gray	Silt, clay	
BS-24G	9/10	79°15'	71°03'	199		Mod Ewing	2W			Brown	Gray	Silt, clay	
BS-24	9/10	79°16.2'	72°00'	183		Mod Ewing	350	23	23	Brown	Gray	Soupy, silty, clay at top with very dense pebbly gray sand at bottom	
BS-25G	9/10	79°16.2'	72°00'	183		Orange Peel	2W			Brown	Gray	Soupy, silty, clay at top with very dense pebbly gray sand at bottom	
BS-26G	9/10	79°17.0'	72°39'	222		Orange Peel	2W			Grayish	Brown	Unable to penetrate bottom with core. Very coarse and pebbly	

TABLE II. (Cont'd).

Vessel: SOUTHWIND				Cruise: KANE BASIN								Checked by	Date checked
Bottom Sediment No. BS	Date 1969	Sample Position Latitude N	Sample Position Longitude W	Depth Meters	Geomorphology of Immediate Area	Type of Sampler	Weight of Sampler	Approx Penetration	Length of Core	Sediment Color Core Top	Sediment Color Core Bottom	Field Description of Core and Remarks	Obs Init
BS-25	9/10	79°15'	73°48'	238		Mod Ewing	350	136	54	Brown	Brown	Coarse sand at top to finer material at base	
BS-27G	9/10	79°15'	73°48'	238		Orange Peel	2W			Brown	Brown	Pebbles, Cobbles, shells, sea urchin	
BS-26	9/11	79°02.5'	72°46.0'	273		Mod Ewing	350	208	80	Brown Olive	Gray	Pebbles, marine life, silt, clay	
BS-28G	9/11	79°02.5'	72°46.0'	273		Orange Peel	2W			Brown	Gray	Pebbles, silt, clay	
BS-27	9/11	79°00'	72°00'	218		Mod Ewing	350			Brown	Gray	Pebbles, silt, clay, coarse sand	
BS-29G	9/11	79°00'	72°00'	218		Orange Peel	2W			Brownish	Gray	Rock, Coarse sand, clay, silt	
BS-28	9/11	79°00'	71°00'	373		Mod Ewing	350	345	195	Brown	Gray	Silty clay	
BS-30G	9/11	79°00'	71°00'	373		Orange Peel	2W			Brown to	Gray	Silty clay	
BS-29	9/11	79°00'	70°00'	391		Mod Ewing	350	315	160	Brown	Gray	Silty clay	
BS-31G	9/11	79°00'	70°00'	391		Orange Peel	2W			Brown	Brown	Silty clay	
BS-32G	9/11	78°45'	71°00'	150		Orange Peel	2W			Brown	Gray	Similar to most other samples - Brown soupy layer covering more dense gray layer. ophurids, pebbles, shells, worms	
BS-30	9/11	78°44'	71°59'	382		Mod Ewing	350			Brown	Gray	Some coarse sand at top	
BS-33G	9/11	78°44'	71°59'	382		Orange Peel	2W			Brown	Brown	Cohesive clay	
BS-34G	9/12	78°42.7'	72°53.5	445		Orange Peel	2W			Olive Brown to Brick Red		Sand, silt, clay and few pebbles	
BS-31	9/12	78°42.7'	72°53.5'	473		Mod Ewing	350			Olive Brown to Brick Red		Sand, silt, clay	
BS-32	9/12	78°30.5'	72°59.0'	202		Mod Ewing	350	None	Core Head Bent			2 pebbles and 1 piece of coral	
BS-35G	9/12	78°31.0'	73°05'	348		Orange Peel	2W					1 pebble	
BS-33	9/12	78°29.0'	73°52.0'	538		Mod Ewing	350	to weights	215	Olive Brown	Gray	Coarse Sand, silt, clay	
BS-36G	9/12	78°29.7'	73°52.0'	496		Orange Peel	2W			Olive Brown		Pebbles, coarse sand, sand, silt, clay	
BS-34	9/12	78°13'	74°49'	620		Mod Ewing	350	340	181	Brown	Gray	Silty clay	
BS-37G	9/12	78°13'	74°49'	620		Orange Peel	2W			Brown to	Gray	Soupy brown grading down to dense gray sediment. Silty clay with pebbles	
BS-35	9/12	78°15'	74°00'	639		Mod Ewing	350	300	230	Brown	Gray	Silty clay	
BS-38G	9/12	78°15'	74°00'	639		Orange Peel	2W			Brown	Brown	Cohesive clay with numerous worms	
BS-39G	9/13	78°15'	73°00'	123		Orange Peel	2W					1 large rock with some fauna	
BS-36	9/13	78°15'	73°00'	245		Mod Ewing	350					Small pebbles, shells, etc. in catcher	

TABLE II. (Cont'd).

Vessel: SOUTHWIND | Cruise: KANE BASIN | Checked by: | Date checked:

Bottom Sediment No. (BS)	Date 1969	Sample Position Latitude (N)	Sample Position Longitude (W)	Depth Meters	Geomorphology of Immediate Area	Type of Sampler	Weight of Sampler	Approx Pene-tration	Length of Core	Sediment Color Core Top	Sediment Color Core Bottom	Field Description of Core and Remarks	Obs Init
BS-40G	9/13	78°00'	73°00'	132		Orange Peel	2W					3 rocks with various types of fauna	
BS-37	9/13	78°00'	74°00'	519		Mod Ewing	350	130	52	Gray	Gray	Sand, pebbles, silt, and clay	
BS-41G	9/13	78°00'	74°04'	519		Orange Peel	2W					3 pebbles	
BS-42G	9/13	77°59.9'	75°00'	648		Orange Peel	2W			Brownish	Gray	silt and clay	
BS-38	9/13	78°00.5'	75°00'	648		Mod Ewing	350	48	32	Gray	Gray	silt and clay	
BS-39	9/13	77°44.5'	74°44.4'	570		Mod Ewing	350	85	75	Gray	Brownish Red	Silt and clay	
BS-436	9/13	77°43.4'	74°48'	570		Orange Peel	2W					2 pebbles and fauna	
BS-44G	9/13	77°44.5'	73°58'	311		Orange Peel	2W			Brown	Brown	Many pebbles & cobbles, abundant Benthic lifea	
BS-45G	9/13	77°45.0'	72°57.2'	131		Orange Peel	2W			Brown	Brown	Pebbles, sand, silt, clay Benthic fauna	

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13. ABSTRACT

The Naval Oceanographic Office (NAVOCEANO) conducted a bottom survey of the Kane Basin during September 1969 aboard USCGC SOUTHWIND (WAGB 280). The primary purpose of the survey was to obtain data on the composition and configuration of the Basin floor.

NAVOCEANO operations included core and grab sampling at 47 stations, 9 camera lowerings, and over 1,000 miles of bathymetric soundings. A Coast Guard Oceanographic Unit made temperature, salinity, and oxygen measurements at 19 Nansen cast stations.

The floor of Kane Basin is extremely hard. Corer penetration averaged 121 cm and ranged from 0 to 350 cm. Based on a cursory examination of less than one-fourth of all samples taken, the following rock types have been identified: garnetiferous and granitic gneiss, quartzite, limestone, granite, slate, sandstone, and coal. The primary agent of transport and deposition affecting the most recent sediments appears to be ice rafting, with stream runoff and current activity playing lessor roles.

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